

MEDICINE

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THE INFLUENCE OF THE PERSON DISCHARGING BACTERIA CONTACT ON TUBERCULAR INFECTION IN CHILDREN

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Abstract

Living in the focus of tubercular infection is the main threat for a child's health. Epidemiological factor, which means having a contact with **TBC patient** in family, relatives and neighbourhood, in schools and kindergartens, is the leading risk factor which favours children's contamination and disease.

The goal of research is to study the influence of the person discharging bacteria contact on tubercular infection in children in Republic of Sakha Yakutia.

208 children of tender age and preschool age had been under the care: the contact frequency of 132 children who were on hospital treatment, got 73,0%.

it is noticed that a hyperergic reaction, often with necrosis, was present in 100% of children who had contact with 2-3 people having tuberculosis in their families. Discernible symptoms of tuberculous intoxication were present in 55,2% of children of massive intrafamiliar tubercular contact.

When investigating the period of hospital treatment of active tuberculosis which was conducted on I, IV basic regimens and individual regimen, there developed that length of hospital stay of children of multiple intrafamiliar tubercular contact get 9 months, and in the drug resistant focus of infection, the chemotherapy duration got more than 1 year.

Key words: tubercular infection, children and adolescents, focus of the tubercular infection, person discharging bacteria.

Introduction: Tuberculosis is a widely spread infectious disease in the world. According to WHO (world health organization) statistics, the third of world population is infected with bacillus Kochii. In 2014, 9,6 million people in the world had a tuberculosis and 1,5 million people died from this disease. More than 95% death from tuberculosis happens in the countries with mean and low incomes and this disease is one of the main three causes of women's death at the ages from 15 to 44. In 2014, about 1 million children had a tuberculosis and 140 000 died from this disease (WHO statistics, 2016).

Socially significant diseases, particularly, tubercular infection, refers to urgent problems today's world and became one of the critical health threat of population. The most vulnerable group is children and adolescents, which is involved rapidly into epidemiological process. Socially significant diseases represent colossal damage to society, require heavy expenses for treatment and rehabilitation. Tuberculosis intoxication symptoms are kept in children and it can be one of the causes of chronic primary and postprimary tuberculosis' progression in adolescence life or at juvenile age.

In future years, there will be a possibility of process reactivation which requires a surgical service for elimination residual and posttuberculous changes. From all has been mentioned it follows that tuberculosis among children and adolescents is still a deep problem of today's world. Tuberculosis incidence rate among children in Russian Federation at the ages from 0-14 reduced by 7,7% (2013- by 14,3%; 2014-13,2%; 2015-12,4, reduced by 100 000). The prevailed ages, among children (of 0-14), are: 7-14 (49%), 3-6 (37,6%). The children of tender age (0-2) got 13,4%.

Tuberculosis incidence rate among children of 15-17 also reduced in 2014 by 12,6% compared to 2013.

Tuberculosis incidence rate among children in Republic of Sakha Yakutia is still higher than in Russian Federation. In 2014, the incidence rate got 23,6% per 100 000 of population. In 2015, it got 20,5 per 100 000 of population, which is still higher than RF's incidence rate.

In Russian Federation, big systematic work has been carried during several decades, on prevention of tuberculosis among children. The whole system of antituberculous measures is developed and has been carried out. The providing children and adolescents with antituberculous treatment has basically precautionary meaning and is aimed at infection prevention, early detection of infected, dispensary observation of children and adolescents at risk and TBC patients with the aim of preventing disease progression.

Despite the current methods of tuberculosis' preventive treatment of high-risk group of last years, incidence rate among children living in the focus of infection is still high. The Incidence rate among children of person

discharging bacteria contact, exceeded the case rate in these age groups in Russia thirtyfold, adolescents – 25 times.

The number of children who had tuberculosis and from the other observed TB dispensary's risk groups related reservoir of infection's increase – the number of infected children with person discharging bacteria increased more than twofold (about 2% of children population), [1,2,3,6].

Due to this fact, study of the influence of the person discharging bacteria contact on tubercular infection in children in Republic of Sakha Yakutia is still very urgent and important problem of phthisiatry, during epidemiological situation in a climate of tuberculosis' growth with multidrug resistance of causative agent.

The goal of research is to study the influence of the person discharging bacteria contact on tubercular infection in children in Republic of Sakha Yakutia.

Materials and methods.

208 children of tender age and preschool age had been under the care. Tuberculosis diagnosis was being established basing on disease pattern, tuberculin test dynamics with 2 TE, X-ray inspection of lungs, micrography and sputum culture. According to data analysis of epidemiological anamnesis: contact frequency of 132 children who were on hospital treatment got 73,0% who were divided into following groups: 1) Children, who has tuberculosis and tuberculosis' infection, of family or affined contact, who got 71 cases (53,8%), 2) patients who had multiple contact – 33 cases (25%), 3) 2 sickness cases in the focus of infection (1,5%), 4) Accidental contact – 26 (17,4%), 5) having contact patients who have drug resistant tuberculosis – 65, 6) unidentified contact – 76 cases, which shows unknown infection sources to TB dispensary. The data analysis was achieved with the use of Statistica for Windows Version 6 program.

Results and discussions.

When analysing medically social risk factors it was identified: social risk factor – 68% infected children were living in single parent families busy with menial work, often of asocial behavior and having bad habits. Large families got 76,1%, basically living in countryside, in overcrowded accomodation with no modern conveniences. Only 32% of children were living in secured families, with both employed parents and having no bad habits.

31% of children were living in partially comfortable and comfortable houses,

60% patients – in stove heating houses, with no drainage, 9% of patients – in hostels.

Categorization of patients into age groups shows that 46,2% of infected are children of tender age, 43% are children of preschool age, 10,8% are children of primary school. The younger the child, the more dangerous the

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contact with TB patient can be for him, especially coupled with living conditions.

According to medical factors' risk, it should be noted that 51,7% of sick children was related to so-called "sickly children". The percentage coverage of BCG vaccination in our patients has been studied. The results of the percentage coverage of BCG vaccination showed that the great majority of the sick children (99,8%) was vaccinated. One child wasn't vaccinated on medical grounds because of multiple anomalies progression, who had massive intrafamiliar contacts with drug-resistant tuberculosis from an early age, which led to generalizable tuberculosis' process.

Local form of tuberculosis in children were found out by tuberculine test in 74% cases, local tuberculosis was found out in 17,4% in examination concerning the contact, concerning the appealability – 8,6%.

it should be noted that preventive treatment of infected and exposed people was provided as ambulatory treatment by uncontrollable method which favoured the progression of the disease. As for the conversion of tubercular reaction in 51,7%, preventive treatment wasn't provided. Isolation of children in TB dispensaries was carried out only in 21,9% of cases, it's because of parent's refusal of their children's hospitalization.

While analyzing the clinical tuberculosis' form, along with prevailing form of primary tuberculosis - Tuberculosis of intrathoracic lymph nodes, generalized and complicated process were being registered, such as tuberculous spondylitis, combined with affect of all intrathoracic lymph nodes and lungs, and disease progression's process, in the form of inveterate, with bronchopulmonary affect, lymphohematogenous dissimulation, pleuritis got 20,3%. Studying the tuberculous process period, on admission to hospital, Tuberculosis of intrathoracic lymph nodes and tuberculous primary complex in infiltrarion period were found out in 31,1%, in 42,3% in period of resorption and carnification, and 26,6% in period of calcification.

Thus, 68,9% of children undergoing outpatient treatment, were admitted in regression period of tuberculous process. The pattern of tuberculous contact, its intensity and duration, presence of MDR in person discharging bacteria, influences on specific process course in children. Due to this, we have studied contacts on degree of relationship: mother – 15,6%, father – 10,3%, grandmother – 10,3%, grandfather – 7,1%, postmortal contact – 4,2%. The most attention was paid to analysis of tuberculin test's irritability in infected children from various focuses of tubercular infection which showed that on admission to hospital hyperergic reaction, often with necrosis was observed in 100% of children from multiple contact, in families with 2-3 members who had tuberculosis. On accidental contact, positive reaction of average intensity was observed in 46,7% of cases, high-grade sensitivity – in 15,4%, hyperergic reaction – in 7,7%.

Children from intrafamilial contact had high-grade sensitivity (44,2%) and hyperergic reactions (11,6%), in other words, more than half of children had high-grade sensitivity to tuberculous infection. In comparative research of clinical blood analysis in children suffering from tuberculosis of unidentified contact and children having a family contact, was established that index of erythrocyte sedimentation rate is higher in children with family contact (with unidentified contact $7,2 \pm 0,9$, family contact - $11,7 \pm 1,4$ per hour $p < 0,005$).

It was found out that patients with family contact were hospitalized with hypochromic anemia, compared to children with unidentified contact (Hb rate got - $109,4 \pm 1,5$ and $114,7 \pm 1,5$ thus $p < 0,01$, RBC count $3,725 \pm 0,056$ and $3,864 \pm 0,053$ thus, $p < 0,05$). Severe symptoms of tuberculous intoxication were found out in 55,2% of children of intrafamilial tubercular contact. Complicated tuberculous process was observed in 23,9% of children from family contact, the focus of tubercular infection, however, among the children with unidentified source of infection, the complicated tuberculous process was observed in 4,4% of cases. The study of primary tuberculosis local form process showed that delayed positive dynamics in the course of specific treatment in a clinical setting was found out in children from drug resistant centres in 17.2% of cases.

When investigating the period of active tuberculosis' hospital treatment, being provided on I,IV of chemotherapy standard regimes and individual regime, it was found out that more long-term intensive phase from 90 to 120 dosis was administered to children of multiple family tubercular contact, the length of hospital stay got 9 months. The chemotherapy length of the focus of drug-resistant disease got 1 year and more. By comparative study of patient days from unidentified contact and from the focus of tubercular infection, it was found out that children from the FoD has been administered tuberculosis services much longer. ($259,4 \pm 19,6$ and $320,4 \pm 12,7$, thus $p < 0,01$).

Conclusions:

1. Having close, long-term contacts with family members, relatives and patients with drug-resistant tuberculosis coupled with social disadvantages lead to development of complicated process in children with slow positive dynamics.
2. On admission to hospital, hyperergic reaction on tuberculine test with 2Tu PPD-L, often with necrosis, was observed in 100% of children of multiple contact, whose 2-3 family members had tuberculosis, this goes to prove a high degree of body's sensibilization to tubercular infection.
3. The hospital TB services of children of multiple family tubercular contact got 9 months. The chemotherapy length of the focus of drug-resistant disease got 1 year and more.

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